



ADVANCED WINDOWS

Share a web connection

If you have two or more PCs you can share an internet connection between them without having to buy extra software. Karl Wright explains how Windows can bring the internet to multiple users

When you're looking for something on the web, you don't want someone standing over your shoulder waiting for their turn online. Thankfully, there's something you can do to avert this problem. With the Internet Connection Sharing feature built into Windows you can use the same internet connection on a number of PCs. In this month's *Advanced Windows*, we show you how to configure Internet Connection Sharing the right way. We'll also show you how to share your connection wirelessly, use a router and turn a Windows PC into a professional-style proxy server.

ADDRESS CODE

Every computer on the internet, or any network, is identified by a unique number called an IP address. When computers on the web exchange information – for instance, when your PC logs on to a web page – they address the information they are sending using IP addresses. Because of this, no two PCs on a network can have the same IP address.

When you connect to your internet account, your ISP loans you an IP address. While you are connected, this address is unique to the device you use to connect to the net, whether it's a dial-up modem, ADSL modem or cable modem. If there were no way to share an internet connection, you would need a modem of some sort and a unique IP address for every computer you wanted to use to access the internet. This would be inefficient and expensive.

This is where Internet Connection Sharing comes in. Instead of using two or more modems, you designate one PC to connect to the internet and tell it to share that connection with the PCs on your network. This PC is called the ICS Host.

For connection sharing to work, the host must have two things: a network card for the internal

home network and something to which you attach the modem. This could be another network card, if you have an Ethernet modem, or a serial port or USB port for dial-up modems.

In effect, the ICS Host is a member of two networks: the internet and your small home network. To the computers on your home network, the host behaves just like your ISP's server and gives them each their own IP address. Every network that uses Internet Connection Sharing has the same range of IP addresses. The network card in the host computer, which is attached to the home network, has the address 192.168.0.1. The host gives the other computers IP addresses starting from 192.168.0.2.

Whenever one of the clients in your home network wants to access a web page or other internet service, it sends a request to the ICS Host. The host passes the request on to your ISP. The ISP sends the relevant information back to the public network adaptor (modem) of the host, and the host passes the information to its client on the home network. At no point do any of the client PCs on the home network communicate directly with any PC on the internet, so it doesn't matter that they have the same IP addresses as thousands of other PCs all over the world.

MAKING THE CONNECTION

To set up Windows Internet Connection Sharing, you need a computer with a connection to the internet. It doesn't matter how that connection works. It can be a normal dial-up connection, ADSL or cable service. The only kind of connection that doesn't work with ICS is a one-way internet adaptor. Some satellite broadband adaptors can only receive data, and use your PC's dial-up modem for sending data out. You would need to share both

the network adaptor to which the satellite dish was connected and the dial-up modem. ICS can't do this. If you're one of the few people with this type of connection, you should contact your ISP to find out how you can connect more than one computer.

As we've mentioned, the ICS Host computer must have two network adaptors. The exact type of network adaptors depends on how the PC connects to the net and how you want to connect it to the other PCs in your network. If your PC connects to the net using a cable or ADSL modem that plugs into an Ethernet networking port, you simply share the Ethernet adaptor. If you use a dial-up modem, you can share the modem itself. To communicate with the PCs on the home network you can use a second Ethernet adaptor – because having two Ethernet adaptors in one PC is fine – or use a WiFi wireless networking adaptor. The advantage of using WiFi is that it's much easier to connect more than one PC to your ICS Host at the same time.

If you're connecting a client directly to your host using an Ethernet cable, make sure you use something called a crossover cable. If you don't have one you'll have to buy one, but they should only cost two or three pounds. If you want to share the connection with more than one other computer using a wired Ethernet network, you'll need a hub and several regular network cables. In this case, the hub does the 'crossing over'.

CREATE AN AD HOC NETWORK

To share your PC's internet connection using a wireless network you must create an ad hoc wireless network on the host PC. The other WiFi-capable PCs in your home can connect to this network whenever the host PC is on.

Open the Control Panel and double-click on Network Connections. Right-click on the entry for

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C:\WINDOWS\system32\cmd.exe

Ethernet adapter Local Area Connection:

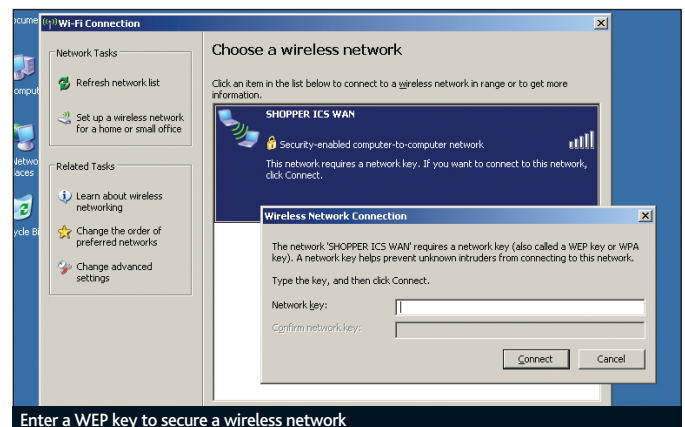
Media State . . . . . : Media disconnected
Description . . . . . : Intel(R) PRO/100 VE Network Connection
Physical Address. . . . . : 0C-03-17-EB-78-EP

Ethernet adapter Wireless Network Connection:

Connection-specific DNS Suffix . : KLS-530 Wireless PCI Desktop Network
Description . . . . . : 
Physical Address. . . . . : 00-53-C3-1C-20-58
Dhcp Enabled. . . . . : Yes
Autotconfiguration Enabled . . . : Yes
IP Address. . . . . : 192.168.1.18
Subnet Mask . . . . . : 255.255.255.1
Default Gateway . . . . . : 192.168.1.0
DHCP Server . . . . . : 192.168.1.0
DNS Servers . . . . . : 192.168.1.0
Lease Obtained. . . . . : 25 May 2005 00:14:21
Lease Expires . . . . . : 28 May 2005 00:14:21

C:\Documents and Settings\Karl.NEC>
  
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Every PC on a network has a unique IP address. To find out your PC's IP address, go to Start, Run and type cmd. In the command box, type ipconfig /all and press Enter. If your PC is connected to two networks with two adaptors, each adaptor will have its own IP address



HOW TO... Set up an ICS Host/Client

Sharing your internet connection is a straightforward procedure, as long as you follow a few simple rules. Before you start, make sure that you have a local network set up and that your host PC connects to this network using its second network adaptor – not the one that is used for your internet connection. Check your internet connection is working properly on your host PC before you start.

1 Configure the PC that is already connected to the internet. From the Start menu, open the Control Panel. Double-click on Network Connections and right-click the icon of the network adaptor that's connected to the internet. Choose Properties from the menu that pops up. Make sure you are clicking on the right icon.

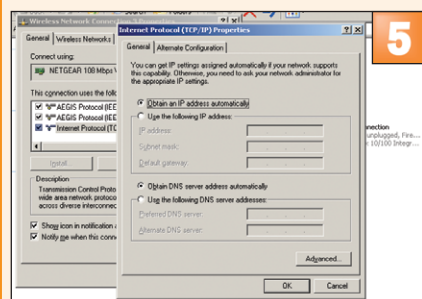
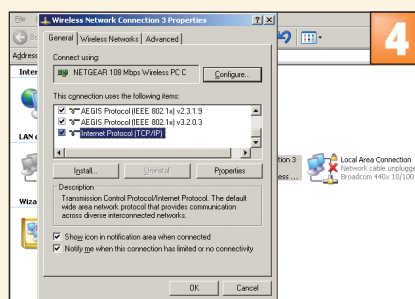
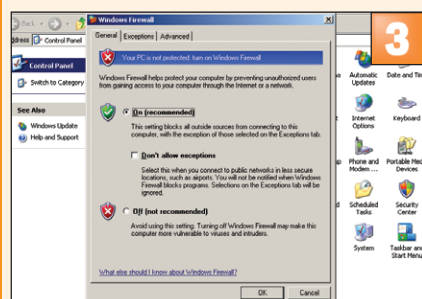
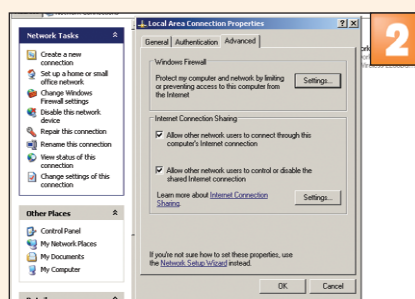
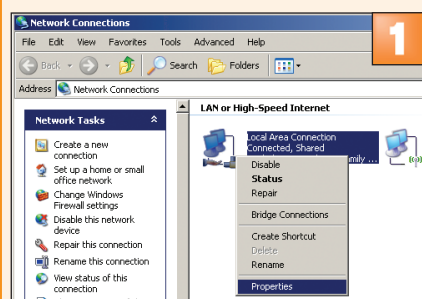
2 On the Advanced tab you will see two options, asking you whether you want to allow other network users to connect to the internet through this PC and whether those users should be allowed to control or disable the shared internet connection. Make sure the boxes next to both options are ticked and click OK.

3 Open Control Panel and choose Windows Firewall. Make sure it is on as ICS won't work unless it's running. On the Exceptions tab ensure that the UPnP Framework option is ticked.

4 Open Network Connections on the client PC. Right-click the network adaptor the PC will use to connect to the ICS Host. Open Properties and find Client for Microsoft Networks and Internet Protocol TCP/IP. If either is missing, click install.

5 Double-click the entry for Internet Protocol TCP/IP. The adaptor must be set to acquire its IP address and DNS Server automatically. Go to Tools, Options, Connections in Internet Explorer, click the LAN Settings button and ensure IE will detect settings automatically.

6 Your PCs should now be set up to use Internet Connection Sharing, with each one able to access the internet. However, anyone using the host PC must be very careful what they do. If they reboot or switch the host PC off, everyone else in the house will lose their internet connection.



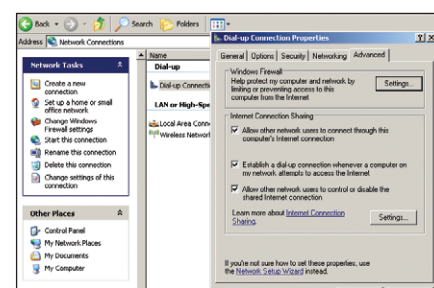
your wireless adaptor and select Properties. On the Wireless Networks tab, click the Add button.

Enter the name you want to give your Ad Hoc Network in the box called SSID. Tick the box that reads This is a computer-to-computer (ad hoc) network; wireless access points are not used. Secure your network with a WEP key.

On your client PC, double-click the wireless network icon. Click View Wireless Networks on the box that pops up. Your wireless network should be listed. Double-click the network's entry and enter your WEP key, and your PC will be connected. For a detailed explanation of using WEP keys, read *Advanced Windows*, Shopper September 2005.

DIAL-UP

To share a dial-up connection, make sure you tell your ICS Host computer to dial your ISP every time one of its clients asks for a connection to the internet. Go to the Control Panel and open Network Connections. Right-click the shared dial-up connection and go to Properties. On the Advanced tab, tick the option that reads Establish a dial-up connection whenever a computer on my network attempts to access the internet.

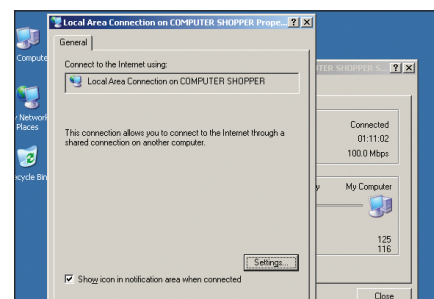


Click the option that reads Establish a dial-up connection whenever a computer on my network attempts to access the internet

ICS DISCOVERY AND CONTROL

Windows Internet Connection Sharing provides a tool called ICS Discovery and Control, which lets the client systems monitor and control the internet connection on the ICS Host PC. To enable this feature, you have to make sure that you select the Allow other network users to control or disable the shared internet connection option. See Step 2 of our 'How To... Set up an ICS Host/Client' walkthrough on the left.

When you connect your client PC to the host, the client should automatically detect the fact that it's connected to an ICS Host PC. An icon for the ICS Host appears under Network Connections. It's useful to have the ICS Host logo displayed in your taskbar, just like any other network connection. To make this happen, right-click the icon in Network



To place the Discovery and Control icon in the taskbar, tick the box that is marked Show icon in notification area when connected



HOW TO... Set up a router

The easiest and most effective way to share an internet connection between a number of PCs is by using a router. Routers can be expensive; a good one with WiFi wireless networking capabilities costs between £60 and £80 including VAT.

The advantages of having a router are that it is always on and no-one will reboot it when they install a new game. Routers are much simpler devices than PCs, so fewer things can go wrong with them. They are also smaller and consume less electricity. Here we show you how to set up a

Draytek Vigor 2600VG router, but all routers work in a similar way.

1 Connect your router to one of the PCs in your network. Even if you intend all the PCs in the network to connect wirelessly, make the first connection using an Ethernet cable. This is more secure than doing the initial configuration wirelessly.

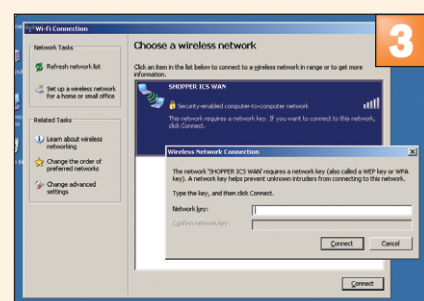
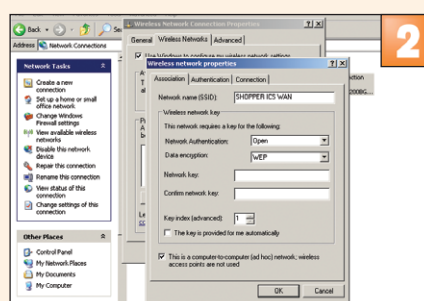
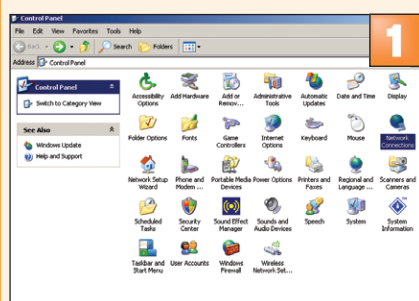
Once you're connected, open your web browser and type your router's default IP address, which you'll find in the manual, into the address bar. This opens the router's control panel.

2 Click on the Internet Access Setup option or its equivalent on your router. Most routers now have an auto-detect function. This queries your ISP and finds the necessary

settings. Just enter your broadband username and password. If you have an old-fashioned router that requires you to enter all settings manually, call your ISP and find out which protocol the router uses, the VPI and VCI settings, the encapsulation method and PPP authentication method.

3 If you want to share your internet connection wirelessly, open the router's wireless settings page in your browser. Enable wireless broadcasting, give your network a name and change the network security settings. We recommend using WPA encryption, which all modern routers and wireless adaptors support.

All that remains is to connect your client PCs to the wireless network. This works in exactly the same way as connecting to an ad hoc network; see our instructions on page 240 opposite.



Connections, choose Properties and tick the option that tells Windows to display an icon in the notification area when connected.

Double-click on the icon, either in Network Connections or your taskbar, and a window appears that shows information about the internet connection on the host PC. This includes such details as speed, connection status, the number of packets sent and so on. This can be useful for diagnosing any problems.

There is also a button marked Disable. This disconnects the internet on the host computer, but not your network connection to the host. When you disable the connection, the Discovery and Control window closes. To re-enable the connection, go back to Network Places. You'll find that the icon for your ICS Host will be marked as disabled. You need to double-click the icon, so that the host computer will connect to the internet once again.

If you experience any trouble in getting Discovery and Control to open, right-click your network connection to the host and choose the Repair option. Once the connection has been

repaired, Discovery and Control should begin to work properly.

SOFT OPTIONS

Windows ICS does a good job of sharing one internet connection between a number of PCs, but it has only basic features. If you want more specific control over which PCs use your internet connection, you'll need a proper proxy program.

Proxy software works in the same way as Internet Connection Sharing, forwarding requests to your ISP from computers on your network. A good proxy, however, also offers services such as the ability to filter which websites and services specific client PCs are allowed to access and when given client PCs can use the internet connection and for how long. This can be useful if, for instance, you want to prevent specific users accessing services such as peer-to-peer file-sharing or FTP.

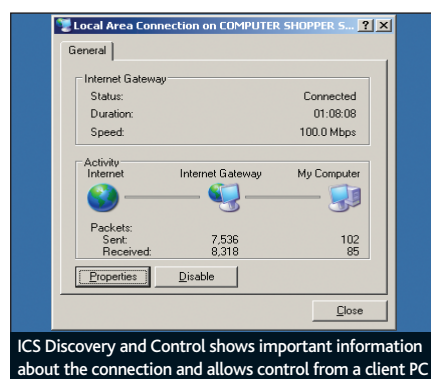
We tried the program cproxy, which is available from www.youngsoft.net. This is free if you use it with three or fewer client PCs. Install the program and open the command prompt. Run `ipconfig/all`. Write down the IP address of the

network adaptor that the host PC uses to connect to the home network. Run the proxy software and make sure the software is set to use the correct IP address. It's also worth noting which ports the proxy has opened for various services.

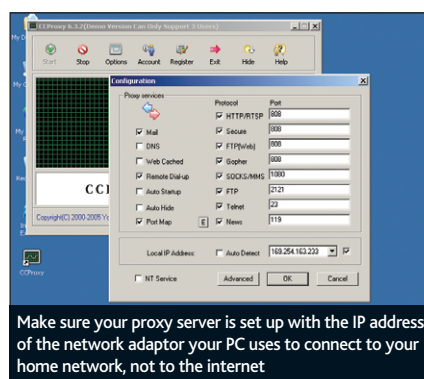
On the client PC, run Internet Explorer, go to Tools and Options and choose the tab called Connections. Click on the LAN Settings button and then on Advanced. Enter the IP address of the proxy server and all the relevant ports. Click Apply and the client should connect to the proxy server, and you'll be able to surf the web.

SHARE AND SHARE ALIKE

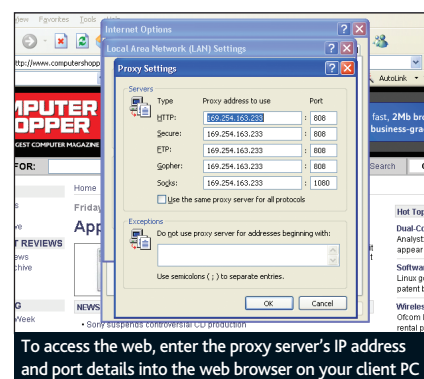
Once you've followed our walkthroughs, you should be able to turn any Windows PC into an Internet Connection Sharing Host. If you have an old PC that isn't powerful enough for regular use, it would make an ideal host machine. ICS has been a feature of Windows since Windows 98, so you don't have to use a modern PC, although for security reasons it's better if you do. For more flexibility and control over your shared connection, either use a proper proxy or spend money on a router (see above). **CS**



ICS Discovery and Control shows important information about the connection and allows control from a client PC



Make sure your proxy server is set up with the IP address of the network adaptor your PC uses to connect to your home network, not to the internet



To access the web, enter the proxy server's IP address and port details into the web browser on your client PC